

Electronics and Instrumentation Engineering

Department

Velagapudi Ramakrishna Siddhartha Engineering College

(Autonomous)

Kanuru, Vijayawada -520 007, Andhra Pradesh



VR20- Scheme of Instructions

for

Four Year B.Tech Programme

Effective from 2020-21

ELECTRONICS & INSTRUMENTATION ENGINEERING

Velagapudi Ramakrishna Siddhartha Engineering College

Program Outcomes

1. An ability to apply knowledge of mathematics, science and engineering fundamentals appropriate to the discipline.
2. An ability to identify, formulate and solve problems by applying the principles of electronic instrumentation and control systems.
3. An ability to design and implement instrumentation and control systems to meet desired needs with appropriate consideration for public health and safety, environment, society, economics and sustainability.
4. An ability to design and conduct experiments as well as to analyze and interpret data.
5. An ability to use the techniques, skills and modern engineering tools necessary for his engineering practice.
6. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.
7. Knowledge of contemporary issues.
8. An understanding of professional, ethical, legal and social issues and consequent responsibility relevant to professional engineering practice.
9. An ability to function on multidisciplinary teams.
10. An ability to communicate effectively with a range of audience in his professional engineering practice.
11. A recognition of the need for and an ability to engage in lifelong learning.
12. An ability to use engineering and management principles to one's own work, as a member and leader in a team to manage projects

Program Specific Outcomes

PSO1: Use basic engineering principles, concepts of measurement and sensor selection applicable to an industrial process.

PSO2: Select and use hardware and software tools for industrial automation systems

ELECTRONICS & INSTRUMENTATION ENGINEERING

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Scheme of Instructions for Four Year B.Tech Programme-VR20

SEMESTER I

CONTACT HOURS: 26

S. No	Course Code	Course	Subject	L	T	P	Credits
1.	20BS1101	Basic Science Course	Matrices and Differential Calculus	3	0	0	3
2.	20BS1102	Basic Science Course	Engineering Physics	3	0	0	3
3.	20ES1103	Engineering Science Course	Programming for Problem Solving	3	0	0	3
4.	20ES1104	Engineering Science Course	Basics of Electrical Engineering	3	0	0	3
5.	20HS1105	Humanities and Social Science	Technical English and Communication Skills	2	0	0	2
6.	20BS1151	Basic Science Course	Engineering Physics Laboratory	0	0	3	1.5
7.	20ES1152	Engineering Science Course	Programming for Problem Solving Laboratory	0	0	3	1.5
8.	20HS1153	Humanities and Social Science	Technical English and Communication Skills Laboratory	0	0	3	1.5
9.	20ES1154	Engineering Science Course	Computing and Peripherals Laboratory	0	0	2	1
10.	20MC1106	Mandatory Course	Technology and Society	1	0	0	-
Total				15	0	11	19.5
11.	20MC1107	Mandatory Course	Induction Program				-

Category	Credits
Basic Science Course	$3+3+1.5 = 7.5$
Engineering Science Course	$3+3+1.5+1 = 8.5$
Humanities and Social Science	$2+1.5=3.5$
Mandatory Courses	0
TOTAL CREDITS	19.5

SEMESTER II**CONTACT HOURS: 27**

S. No	Course Code	Course	Subject	L	T	P	Credits
1.	20BS2101	Basic Science Course	Laplace Transforms and Integral Calculus	3	0	0	3
2.	20BS2102	Basic Science Course	Engineering Chemistry	3	0	0	3
3.	20ES2103	Engineering Science Course	Object Oriented Programming using Python	3	0	0	3
4.	20ES2104 C	Engineering Science Course	Network Theory	3	0	0	3
5.	20ES2105	Engineering Science Course	Engineering Graphics	1	0	4	3
6.	20BS2151	Basic Science Course	Engineering Chemistry Laboratory	0	0	3	1.5
7.	20ES2152	Engineering Science Course	Object Oriented Programming using Python Laboratory	0	0	3	1.5
8.	20ES2153	Engineering Science Course	Engineering Workshop	0	0	3	1.5
9.	20MC2106	Mandatory Course	Professional Ethics and Practice	1	0	0	-
Total				14	0	13	19.5

Category	Credits
Basic Science Course	$3+3+1.5 = 7.5$
Engineering Science Course	$3+3+3+1.5+1.5 = 12$
Mandatory Courses	0
TOTAL CREDITS	19.5

SEMESTER III**CONTACT HOURS: 28**

S.No	Course Code	Course	Subject	L	T	P	Credits
1.	20BS3101	Basic Science Course	Complex Analysis & Numerical Methods	3	0	0	3
2.	20EI3302	Program Core	Electronic Devices and Circuits	3	0	0	3
3.	20EI3303	Program Core	Digital Circuits and Systems	3	0	0	3
4.	20EI3304	Program Core	Sensors and Transducers	3	0	0	3
5.	20EI3305	Program Core	Electrical and Electronic Measurements	3	0	0	3
6.	20EI3351	Program Core Lab 1	Electronic Circuits Lab	0	0	3	1.5
7.	20EI3352	Program Core Lab 2	Digital Electronics Lab	0	0	3	1.5
8.	20EI3353	Program Core Lab 3	Measurements Lab	0	0	3	1.5
9.	20TP3106	Soft Skills – 1	Logic and Reasoning	0	0	2	1
10.	20MC3107A	Mandatory Course (AICTE suggested)	Environmental Studies	2	0	0	-
			Total	17	0	11	20.5

Category	Credits
Basic Science Course	3
Program Core Courses	16.5
Soft Skill course	1
Mandatory Courses	0
TOTAL CREDITS	20.5

SEMESTER IV**CONTACT HOURS: 28**

S.No	Course Code	Course	Subject	L	T	P	Credits
1.	20BS4101	Program Core	Analog Electronic Circuits	3	0	0	3
2.	20ES4102	Engineering Science Course	Integrated Circuits and Applications	3	0	0	3
3.	20EI4303	Program Core	Control Systems	3	0	0	3
4.	20EI4304	Program Core	Industrial Instrumentation	3	0	0	3
5.	20HS4105	Humanities and Social Sciences	Universal Human Values	3	0	0	3
6.	20EI4351	Engineering Sciences/ Program Core Lab1	Transducers Lab	0	0	3	1.5
7.	20EI4352	Program Core Lab 2	Control Systems Lab	0	0	3	1.5
8.	20EI4353	Program Core Lab 3	Integrated Circuits Lab	0	0	3	1.5
9.	20EI4106	Soft Skills – 2	English for Professionals	0	0	2	1
10.	20MC4107B	Mandatory Course (AICTE suggested)	Indian Constitution	2	0	0	-
Total				17	0	11	20.5
Summer Internship six weeks during summer vacation (Mandatory) (EPICS)							
Honors/Minor Courses (the hours distribution can be 4-0-0, 3-0-2 or 3-1-0 also)				4	0	0	4

Category	Credits
Basic Science Course	3
Program Core Courses	9
Engineering Science Course	4.5
Soft Skill course	1
Mandatory Courses	0
Humanities and Social Science	3
TOTAL CREDITS	20.5

SEMESTER V**CONTACT HOURS: 33**

S.No	Course Code	Course	Subject	L	T	P	Credits
1	20EI5301	Program Core	Analytical Instrumentation	3	0	0	3
2	20EI5302	Program Core	Process Control	3	0	0	3
3	20HS5303	Humanities and Social Sciences	Engineering Economics and Management	2	0	0	2
4	20EI5404	Program Elective 1		3	0	0	3
5	20EI5205	Open Elective /Job oriented Elective -1		2	0	2	3
6	20EI5351	Program Core Lab 1	Virtual Instrumentation Lab	0	0	3	1.5
7	20EI5352	Program Core Lab 2	Process Control Lab	0	0	3	1.5
8	20HS5353	Humanities and Social Sciences	English Communication Skills Lab	0	0	2	1/1.5
9	20EI5354	EPICS/ Internship (6 Weeks)		0	0	3	1.5
10	20TP5106	Soft Skills – 3	Personality Development	0	0	2	1
11	20EI5607	Skill Oriented course -1		1	0	2	2
12	20MC5108A	Mandatory Course (AICTE suggested)	Biology for Engineers	2	0	0	-
Total				16	0	17	23.5/23
Honors/Minor Courses (the hours distribution can be 3-0-2 Or 3-1-0 also)				4	0	0	4

Category	Credits
Program Core Courses (Group A/Group B)	10
Humanities and Social Sciences (Group A)	3
Program Elective Courses	3
Open Elective Course/Job Oriented Elective	3
Skill Oriented course/Soft skill Course	3
Mandatory Course (AICTE)	0
Summer Internship	1.5
TOTAL CREDITS	23.5/23

S.No	Course Code	Program Elective – 1	L	T	P	Credits
1.	20EI5404/A	Fiber Optic Sensors	3	0	0	3
2.	20EI5404/B	VLSI Design	3	0	0	3
3.	20EI5404/C	Robotics and Control	3	0	0	3
4.	20EI5404/D	Industrial Communication Networks	3	0	0	3

S.No	Course Code	Open Elective – 1	L	T	P	Credits
1.	20EI5205/A	Biomedical Electronics	3	0	0	3
2.	20EI5205/B	Control System Components	3	0	0	3

SEMESTER VI**CONTACT HOURS: 34**

S.No	Course Code	Course	Subject	L	T	P	Credits
1	20EI6301	Program Core	Microcontrollers and Embedded Systems	3	0	0	3
2	20EI6302	Program Core	Digital Signal Processing	3	0	0	3
3	20EI6303	Program Core	Industrial Automation	2	0	0	3
4	20EI6404	Program Elective 2		3	0	0	3
5	20EI6205	Open Elective /Job oriented elective-2		2	0	2	3
6	20EI6351	Program Core Lab 1	Microcontrollers and Embedded Systems Lab	0	0	3	1.5
7	20EI6352	Program Core Lab 2	Industrial Automation Lab	0	0	3	1.5
8	20EI6353	Program Core Lab 3	Advanced Instrumentation Lab	0	0	3	1.5
9	20EI6554	Mini Project-I	Mini Project	0	0	2	1
10	20TP6106	Soft Skills –4	Quantitative Aptitude	0	0	2	1
11	20EI6607	Skill Oriented Course -2		1	0	2	2
12	20MC6108B	Mandatory Course (AICTE suggested)	Innovation, Incubation & Startup	2	0	0	0
Total				17	0	17	22.5
Industrial/Research Internship six weeks (Mandatory) during summer vacation							
Honors/Minor Courses (the hours distribution can be 4-0-0, 3-0-2 or 3-1-0 also)				4	0	0	4

Category	Credits
Program Core Courses	10
Humanities and Social Sciences	0
Program Elective Courses	3
Open Elective Course/Job Oriented Elective	3
Skill Advanced course/Soft skill Course	3
Mandatory Course (AICTE)	0
Mini Project	1
Industrial/Research Internship (Mandatory) 6 weeks	
TOTAL CREDITS	22.5/23

S.No	Course Code	Program Elective – 2	L	T	P	Credits
1.	20EI6404/A	Biomedical Instrumentation	3	0	0	3
2.	20EI6404/B	Industrial Electronics	3	0	0	3
3.	20EI6404/C	Process Modeling and Simulation	3	0	0	3
4.	20EI6404/D	Renewable Energy	3	0	0	3

S.No	Course Code	Open Elective – 2	L	T	P	Credits
1.	17EI6205/A	Instrumentation Engineering	3	0	0	3
2.	17EI6205/B	Fundamentals of Industrial Automation	3	0	0	3

SEMESTER VII**CONTACT HOURS: 25**

S.No	Course Code	Course	Subject	L	T	P	Credits
1	20EI7301	Program Core	Computer Control of Processes	3	0	0	3
2	20EI7402	Program Elective 3		3	0	0	3
3	20EI7403	Program Elective 4		3	0	0	3
4	20EI7404	Program Elective 5		3	0	0	3
5	20EI7205	Open Elective /Job oriented elective -3		2	0	2	3
6	20EI7206	Open Elective /Job oriented elective -4		2	0	2	3
7	20EI7607	Skill Advanced Course		1	0	2	2
8	20EI7551	Mini Project - II		0	0	2	1
9	20EI7552	Industrial/Research Internship six weeks, after 3rd year (Mandatory) (To be evaluated during VII Semester)		0	0	0	1
Total				17	0	8	22
Honors/Minor Courses (the hours distribution can be 4-0-0, 3-0-2 or 3-1-0 also)				4	0	0	4

Note: Open Elective Courses 3 and 4 are self-learning. Students may opt from any MOOCs platform. They have to submit the certificate before the last instruction day of VII semester.

Category	Credits
Program Core	3
Program Elective	9
Open Elective/Job Oriented Elective	6
Skill Advanced Course	2
Industrial/Research Internship	1
Mini Project	1
TOTAL CREDITS	22

S.No	Course Code	Program Elective – 3	L	T	P	Credits
1.	20EI7402/A	Power Plant Instrumentation	3	0	0	3
2.	20EI7402/B	Industrial Internet of Things	3	0	0	3
3.	20EI7402/C	Wireless Sensor Networks	3	0	0	3
4.	20EI7402/D	Drives and Control for Industrial Automation	3	0	0	3

S.No	Course Code	Program Elective – 4	L	T	P	Credits
1.	20EI7403/A	Advanced Sensors	3	0	0	3
2.	20EI7403/B	Database Management Systems	3	0	0	3
3.	20EI7403/C	Intelligent Systems and Control	3	0	0	3
4.	20EI7403/D	Digital Image Processing	3	0	0	3

S.No	Course Code	Program Elective – 5	L	T	P	Credits
1.	20EI7404/A	Instrumentation and Control in Paper Industries	3	0	0	3
2.	20EI7404/B	Computer Networks	3	0	0	3
3.	20EI7404/C	Sensor Signal Conditioning	3	0	0	3
4.	20EI7404/D	AI & Machine Learning	3	0	0	3

S.No	Course Code	Open Elective – 3	L	T	P	Credits
1.	17EI7205/A	MOOCS	3	0	0	3
2.	17EI7205/B	MOOCS	3	0	0	3

S.No	Course Code	Open Elective – 4	L	T	P	Credits
1.	17EI7206/A	MOOCS	3	0	0	3
2.	17EI7206/B	MOOCS	3	0	0	3

SEMESTER VIII**CONTACT HOURS: 12**

S.No	Course Code	Course	Subject	L	T	P	Credits
1	20EI8551	Major Project**	Project work	0	0	0	12
Internship(6 Months)							
Total							12

**The student should undergo internship and parallelly he/she should work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report.

CREDIT DISTRIBUTION

Year	Semester I Credits	Semester II Credits	Total Credits
I	19.5	19.5	39
II	20.5	20.5[80]	41
III	23.5	22.5[125]	46
IV	22	12	34
Total			160
Non-Credit Courses			
Mandatory Courses		Induction Program Technology and Society Professional Ethics & Human Values Environmental Studies Student Practice Courses Indian Constitution Biology for Engineers	

Contact Hours:

	ODD Semester	EVEN Semester
1st Year	26	27
2nd Year	28	28
3rd Year	33	34
4 th year	25	12